Ohio Agricultural Experiment Station.

CIRCULAR No. 90.

WOOSTER, OHIO, MARCH 1, 1909.

SEASONAL REPORT OF POTATOES—1908.

The past season was not favorable to the growth of potatoes owing to the small amount of rainfall.

Some observations of results for the season of 1908 in potato work and deductions therefrom, based on notes taken at the Experiment Station and reports received by the Cooperative department from several hundred farmers representing every county in the state, are embodied in this circular. Conditions affecting the growing of potatoes vary markedly in different localities and from one season to another in any given locality, so that the results herein given are not stated as factors constant for the varieties in all places nor for all seasons, but simply as recorded by different growers over the state for the past season.

Such a dry season as we have just experienced tests farmers' practice of tillage to the utmost. Some men have reported complete failure in their experiments, owing to the drought, while in most cases special mention was made of the poor season.

When we consider the regularity in the behavior of many varieties on many types of soil, under varying moisture and plant food conditions it becomes evident that we can assume with a fair degree of accuracy varietal descriptions.

The following list of varieties is given which were on trial the past season, the data mostly based upon the reports received from cooperators.

REPORT OF POTATO VARIETY TEST—1908.

Make all records at time of observation—Do not trust to memory. Use additional blanks if more than five varieties are tested.

Row	* Variety	Date of planting	* No. hills per row at planting.	* No. hills per row at digging	Date of maturing	* Yield marketable potatoes lbs.	* Yield unmarketable potatoes lbs.	Date of appearance of blight	* ‡ Kind of blight { early or late }	Damage by blight	Per cent of scab	Cooking qualities { good fair poor }	Marketable qualities { good fair poor }	* Nature and depth of soil†	* Nature of sub-soil	Previous crop	Manure or Com. fertilizer
1																	
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

*These columns are of special importance †See O. A. E. S. soil circular No. 39 which will be sent upon request. ‡Send specimen leaves for determination

How many acres do you usually devote to the potato crop..... What was your field average this year?.....

What varieties of potatoes are grown in your neighborhood?.....

Have you ever sprayed your potatoes?..... If so, with what results?.....

On the reverse side of this sheet make an accurate map of your plots showing each variety in its proper place and in connection therewith the surrounding farm crops. Give a brief description of your method of handling the soil for this crop and note any unusual conditions; insect, storm or other damage; facts regarding rainfall and temperature, also suggestions regarding tests.

Name..... P. O..... Date of mailing.....

My farm is located in..... Township..... County

Where the records are doubtful or nil, the space is left open or marked indeterminate. In other cases the data are given as received but may be somewhat misleading, i. e. some of the early varieties are marked low in yield but it must be remembered that they are low in comparison with some later varieties while compared with early sorts they might rank high. The matter of cooking quality is largely one of personal taste or preference, and in this case the prevailing number of answers generally decided whether it be very good, good, fair, poor or very poor. The same method was used with most items and the same modifying words used. There were a number of other varieties sent out for trial but not enough to give any satisfactory data.

Mention is made in a few instances of tendency to blight and scab. This is quite a variable factor and is only given where it was specially noticeable.

The report sheet used by the Cooperative department for potatoes is appended.

In addition to these variety tests the Experiment Station is also prepared to assist cooperators in making fertilizer and breeding tests.

VARIETIES OF POTATOES TESTED IN 1908.

Variety	Season	Yield	Cooking qualities	Marketable qualities	Color and skin	Shape	Resistance to blight	Resistance to scab
Algoma	.....	Medium to high	Good	Good	White with some russet	Variable, somewhat flattened	Resistant	
A. M. Giant	Late	Indeterminate	.....	Fair	Yellowish white, smooth	Long, cylindrical		
*Banner	Late	Medium to high	Good	Good	White, smooth	Oval, somewhat flattened		
Bovee	Early	Medium to low	Good	Fair	White often pink tint	Short, cylindrical		Quite scab. by.
Cal. Russet	Late	Very low	.....	Fair	Yellowish white, russeted	.....		
Carman No. 3	Late	High	Fair	Very good	White, smooth	Oval, flattened	Resistant	Resistant.
Clyde	.....	Medium	.....	Fair	White, some russet	Round		
D. J. Miller	Medium Late	Indeterminate	.....	Fair	Brownish white, some russet	Variable, rough cylindrical	Resistant.	
Early Bird	Medium	Very high	Good	Good	Yellowish white, lightly netted	Oval to long		
" Breakfast	Medium Early	Very low	.....	Poor	White, netted	Variable, round to oblong	Non-resist	
" Fortune	Early	Very low	Good	Good	Pink, smooth	Medium, somewhat flattened	Non-resist	
" Johnson	.....	High	.....	Fair	White	Round to oval		
" Michigan	Early	High	Good	Good	White, smooth, some russet	Oval to oblong, flattened		
" Monarch	Early	Medium	Good	Fair	White with pink tint	Roundish, oval	Non-resist	
* " Ohio	Very Early	Medium	Good	Good	Light pink	Nearly round	Non-resist.	
" Petosky	Early	Very Low	Good	Good	White, smooth	Round	Non-resist.	Quite scab. by
* " Rose	Medium Early	Medium to low	Good	Good	Rose, smooth	Cylindrical		
" Standard	Early	Very low	Good	Fair	White, russeted slightly	Rather oblong, variable		
" Sunrise	Medium	Very low	.....	Fair	Yellowish white, russeted	Roundish		
Frayer's O. K	.....	Low	Good	Good	Reddish w'te, red eye, some russet	Flattened, oblong, oval		
Green's No. 21	.....	Medium to low	.....	Good	White, smooth, some russet	Round, flattened	Resistant.	
Green Mountain	Late	High	Good	Good	White, some russet	Oval, flattened		
Happy Medium	Late	Low	Good	Good	Yellowish white	Roundish, oblong flattened	Non-resist.	
Harrold's Choice	Late	Very high	Good	Good	White, smooth, some russet	Oval, flattened		
H. Y. Carman No. 3	Late	Very high	Fair	Good	White, smooth	Oval, flattened		
Ionia Seedling	Late	Medium to low	Good	Good	Yellowish white	Flattened, often tapering	Resistant.	
Irish Cobbler	Early	Medium to very low	Good	Good	White	Short, oval, slightly flattened	Non-resist.	Non-resist
Johnson's No. 1	.....	Indeterminite	.....	Poor	White, netted	Round		
Johnson's No. 2	Late	Medium	.....	Good	White, slight russet	Oval, flattened	Partially	
Keller's Gr'n M'ntain.	Late	Medium to high	Good	Good	White, netted	Oval, flattened	resistant.	
Lepas	Late	High	.....	Good	White, slightly netted	Round, oval inclined to be flat	Resistant.	
Lily White	Late	Medium to high	Good	Good	White, netted	Roundish, oblong	Non-resist.	
Livingston	Late	Very high	Good	Good	White, pink eyes, some russet	Medium to long, tapering	Non-resist.	
Market Prize	.....	Low	.....	Fair	White, slightly rough	Short, oval, flattened	Non-resist.	
May's Late	Late	Very low	Fair	Fair	White, netted	Roundish, oval often tapering	Non-resist.	
Merrill	Late	Indeterminite	.....	Fair	White, slightly netted	Cylindrical, round to long		
Miller-Brooke	Medium	Low	.....	Fair	Pinkish brown, netted	Cylindrical		
Money Maker	Late	Very low	Good	Fair	Yellowish white, russeted	Tapering, flattened	Non-resist.	
Morning Star	Medium Late	Medium to low	Good	Fair	Yellowish white, russeted some	Medium to long, flattened	Non-resist.	

*No seed of these varieties available.

VARIETIES OF POTATOES TESTED IN 1908. Continued.

Variety	Season	Yield	Cooking qualities	Marketable qualities	Color and skin	Shape	Resistance to blight	Resistance to scab
*New Snow	....	Very Low	.....	Good	White, netted	Roundish, flattened		Affected
Noroton Beauty	Extra Early	Very Low	Good	Fair	White, pink markings and eyes	Short, roundish	Non-resist.	Affected
Noxall	Late	.....	.. ...	Good	White, flaky	Oval, flattened		
Ohio Wonder	Late	High to very high	.....	Good	White, lighly netted	Roundish, flattened		
President Roosevelt	Late	Medium	Good	Fair to good	White, netted	Roundish oval, flattened		
Prosperity	Late	Medium to high	Good	Good	White, some russet	Roundish oval, flattened	Resistant	
Pioneer	.....	High	.....	Fair	White, smooth	Long, cylindrical		
Reliance	Late	Low	Good	Fair	White with pink tint, netted	Roundish, flattened	Fairly	
Richmond	.....	Low	.....	Poor	Pinkish tint, slightly netted	Oblong oval, somewhat flat'nd	resistant	
*Rural New Yorker	Late	High	Good	Good	White, smooth	Oval, flattened		
Rural Russet	Late	Medium to high	Good	.....	Brownish white, russeted	Flat oval		
Seneca Beauty	Late	Medium to high	Very Good	Good	Red, smooth	Long, oblong to cylindrical		
*S. Com. Violet	Late	Low	Fair	Poor	Purplish red, smooth	Variable, short	Resistant	
Sensation	Early	Medium	Good	Fair	White, pink tint, smooth	Long; cylindrical, variable		
Spaulding No. 4	Medium Early	Low to Medium	Good	Fair	Light pink	Roundish, somewhat flattened		
Stump of the World	Very Late	Medium to high	Good	Fair	White	Roundish, flattened	Resistant	
Star of the East	Medium	Low	.....	Fair	White, smooth	Long, cylindrical		
Toledo Market	Early	Medium	Good	Fair	Pink, smooth	Oblong, cylindrical		
V. Gold Coin	Late	High	Very Good	Good	White, russeted	Roundish oblong, flattened		
Washington	Medium Late	Low	Good	Good	White, smooth	Medium to long, slightly flat		
White Albion	.....	Medium to low	.....	Good	Yellowish brown, smooth	Oval, often flattened		
W. W. Mammoth	Medium Late	High	Good	Good	White, netted	Oval to long, flattened		

*No seed of these varieties available.

The accompanying curves show the behavior of varieties under varying conditions. In all cases a duplicate row of each variety was planted as a check. The curves graphically explain the yields although exact figures are not given. If the curve goes up the yield was high, and if it goes down the yield was low. The figures to the left of the curves represent pounds per row. The length of the rows at the Station were much longer than they were in the cooperators' tests, which explains the higher figures in the curves from the Station.

The solid line represents one row of the variety and the broken line a duplicate row. These curves do not show just which varieties may be depended upon to give the highest yields, but rather the variation in yield of some of the most reliable sorts, under diverse conditions, is not so great as to preclude the possibility of determining very closely their relative standing as to productiveness.

The work of hill selection of seed potatoes as reported in Bulletin 174 of this Station has been continued and also the work on blight-resistant strains of potatoes.

The object of the plant breeder is to determine the best plants in a variety and select seed from them, cultivate them under favorable conditions and thus perpetuate the desirable qualities and characters.

In the work carried on at this Station and reported in Bulletin 174, the variety Carman No. 3 was selected for high yielding. The hills were dug by hand and the hills yielding the largest number of marketable potatoes were selected, and also those yielding the smallest number. These were called high and low yielders and saved for seed. At planting time an equal number of hills were planted and cared for under the same conditions and in addition an equal number of hills were planted from seed which was not selected, but taken from the barrel or bin in the ordinary way of selecting seed. The results have been published and showed undisputed results of the selections. After five years' selection, a strain of high-yielding potatoes has been secured which is plainly superior to unselected stock.

The results of 1908 are given below and also a comparative form in the chart of curves in this circular:

Variety	Row	Good	Small	Bushels per acre
High-yielding Carman No. 3	1 2	163½ 142	38½ 31½	234.8
Low-yielding Carman No. 3	1 2	44 72	31 29½	125.1
Common Carman No. 3	1 2	110 114	52 50½	137.4

This seems to be conclusive evidence that selection pays. According to these figures the increase due to selection was about 41 percent which at present prices gave an added value per acre of more than $68.00.

The method of procedure by which a variety of potatoes is improved is very simple and easily carried out by any careful grower. When the crop is dug the most prolific hills may be selected and kept separate for a comparative test the following season. In this manner a prolific strain may be started. Something may undoubtedly be gained by throwing the product of the most prolific hills together, but this method is open to the objection that the highest yielding hills do not always give the best yielding strains. Where machinery is used in digging it will be necessary to go ahead of the digger in making selections.

Bolley* states that in planting equal weight pieces from small and large tubers, there will not be a sufficient difference in favor of the one or the other size of potatoes to be noticeable under farm methods, provided all are normally matured. This shows that selection from a bin will not necessarily do anything toward improving the crop.

Another line of work on the potato that is of value, if adopted by the grower, is the increased yield which may be secured by selecting blight resistant strains of varieties. A fact which is familiar to every grower of potatoes is that some varieties are much less subject to blight and disease than others and some of the hills of these varieties are more immune than others. W. W. Mammoth was chosen for work along this line and an increase in large potatoes of 40 percent and a total yield of 25 percent was secured. This was attributed to a longer period of growth. This season there was but little blight and practically no difference in yield as shown in the table and curves. However, as the matter stands at present, it appears that if we select the highest yielding hills without much regard to blight we will secure better results than if blight resistance alone is considered.

Variety	Row	Good	Small	Bushels per acre
W. W. Mammoth (Blight resistant)	1	95	26.0	182.9
	2	121	31.5	
	3	119	31 0	
	4	120	33.0	
W. W. Mammoth (Blighting strain)	1	130	24.0	159.9
	2	110	26.0	

*N. Dak. Agr. Exp. Sta. Bul. 130, pp. 210-243: 1897.

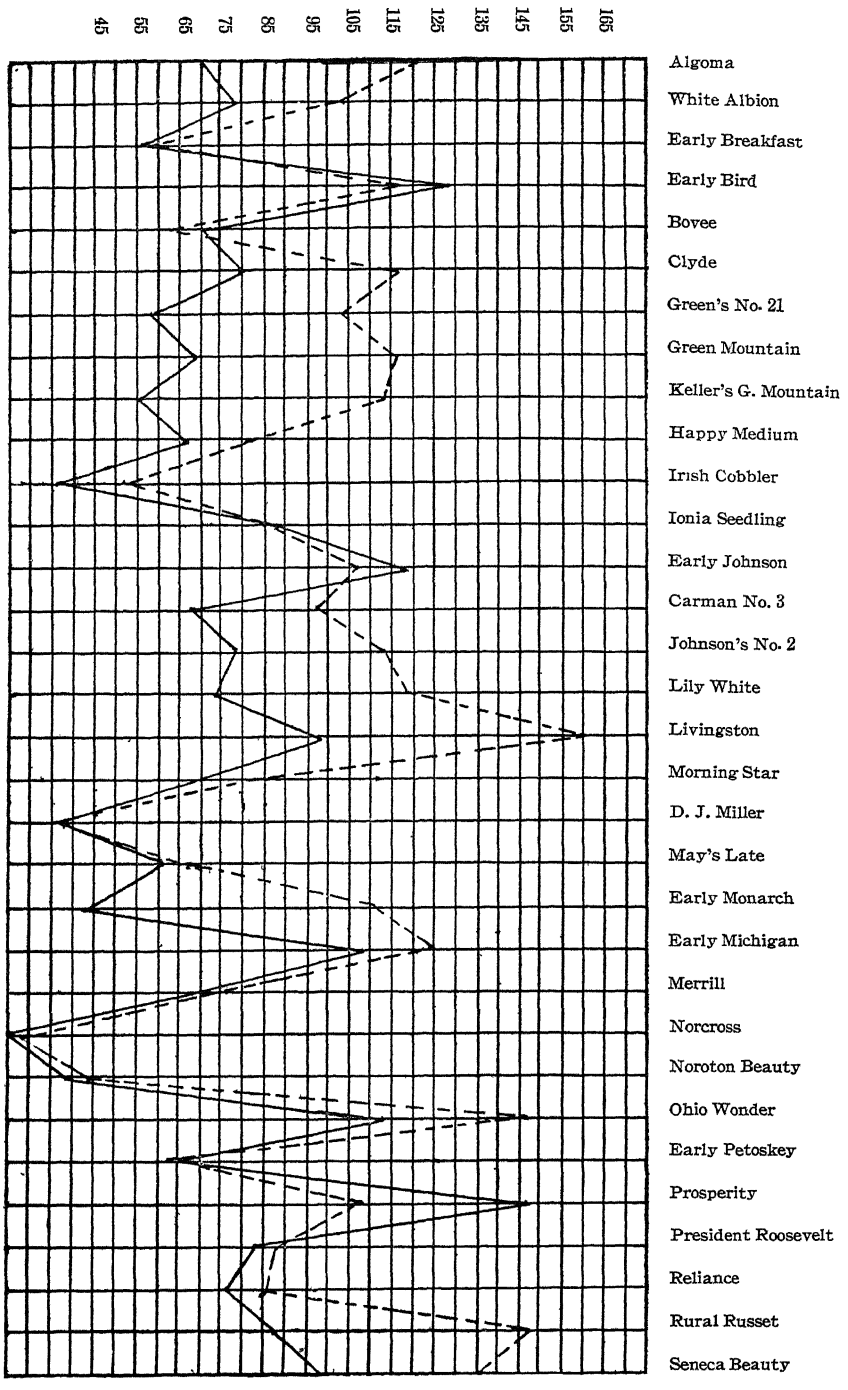

CHART I—Comparative yields of varieties of potatoes grown at Experiment Station on silt loam soil.

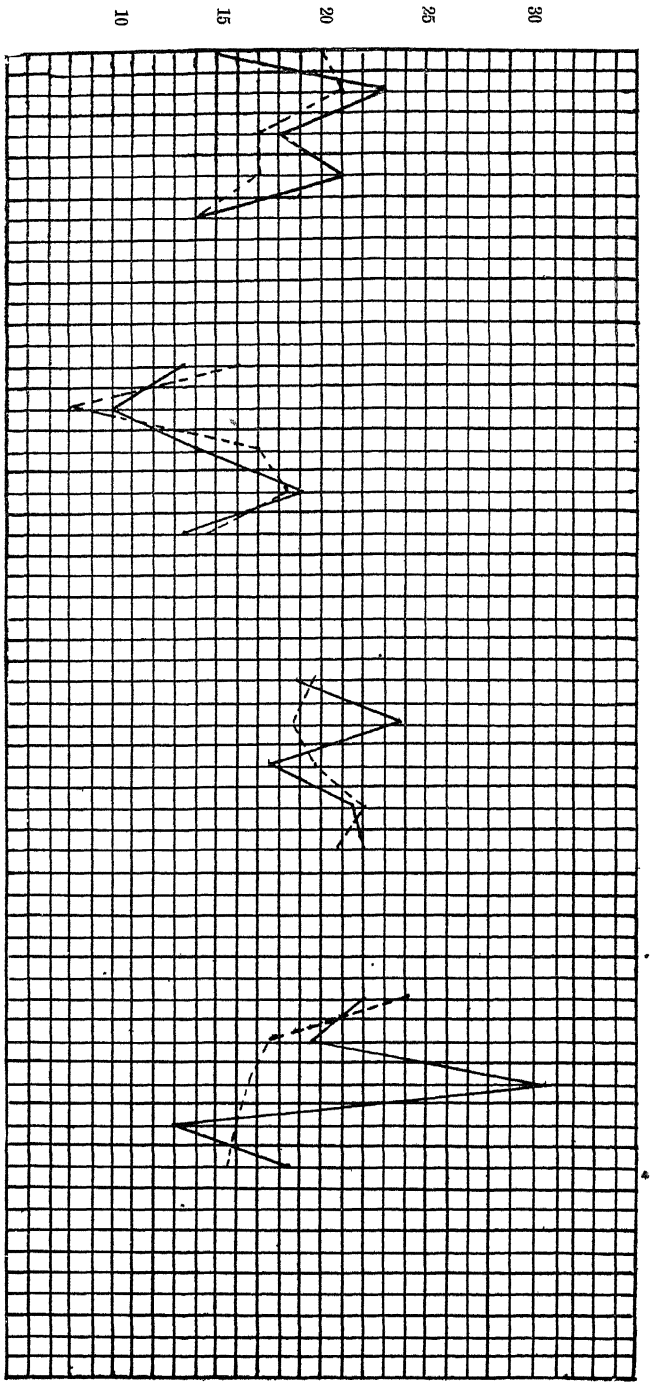

CHART IV—Varieties of potatoes grown on sandy soil.

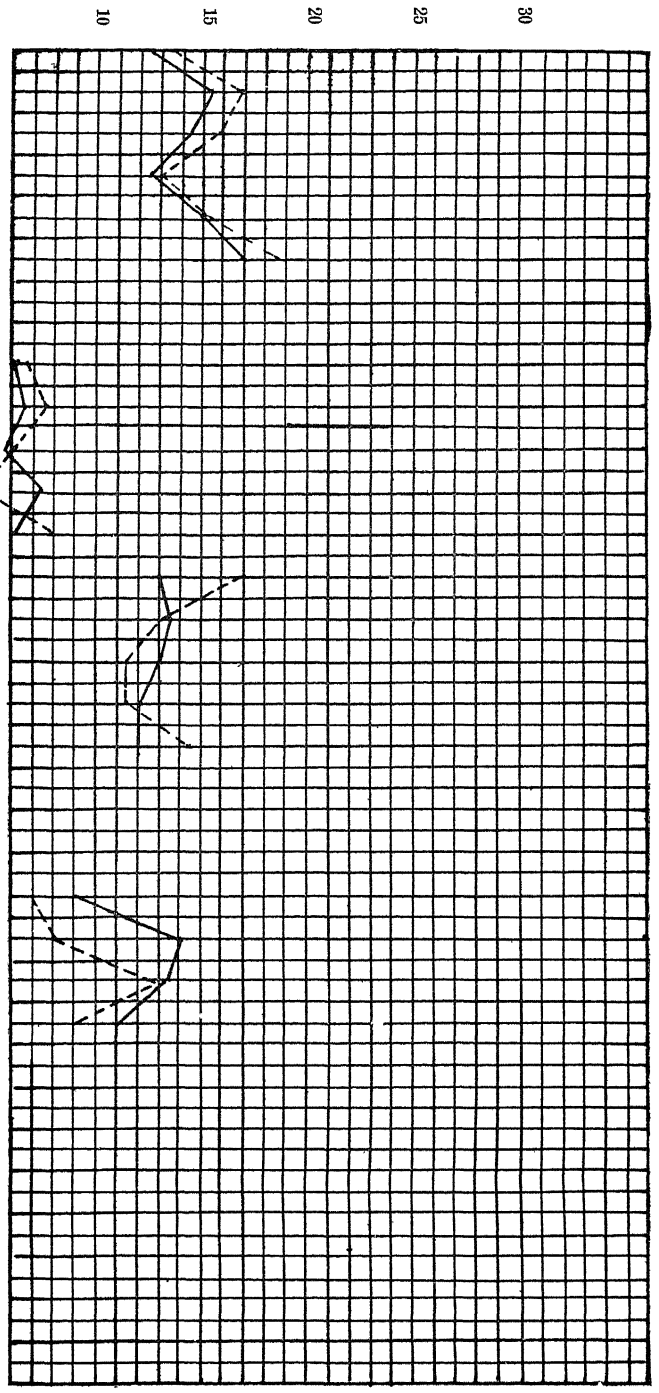

CHART III—Varieties of potatoes grown on muck soils.

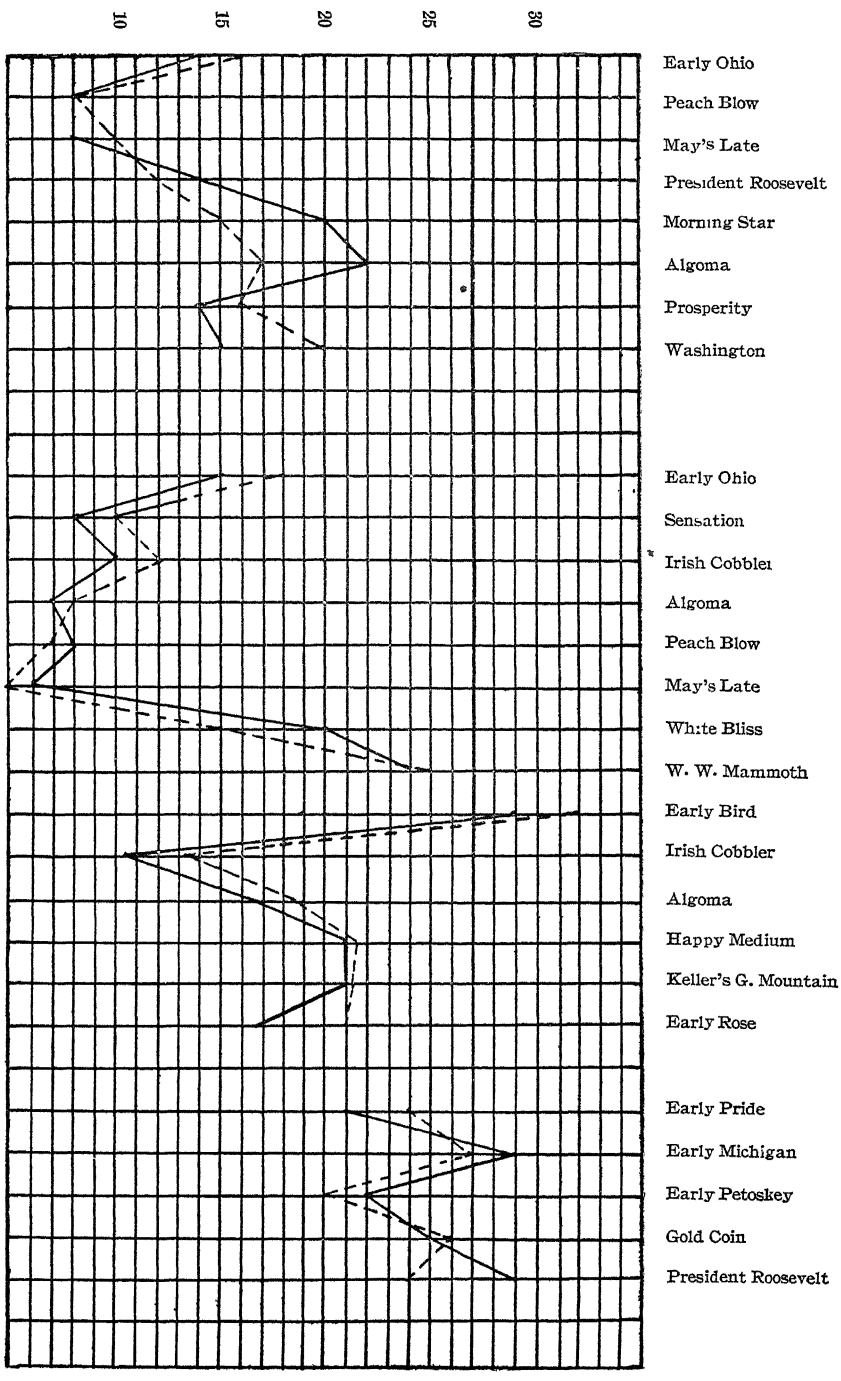

CHART II—Varieties of potatoes grown on clay soils.

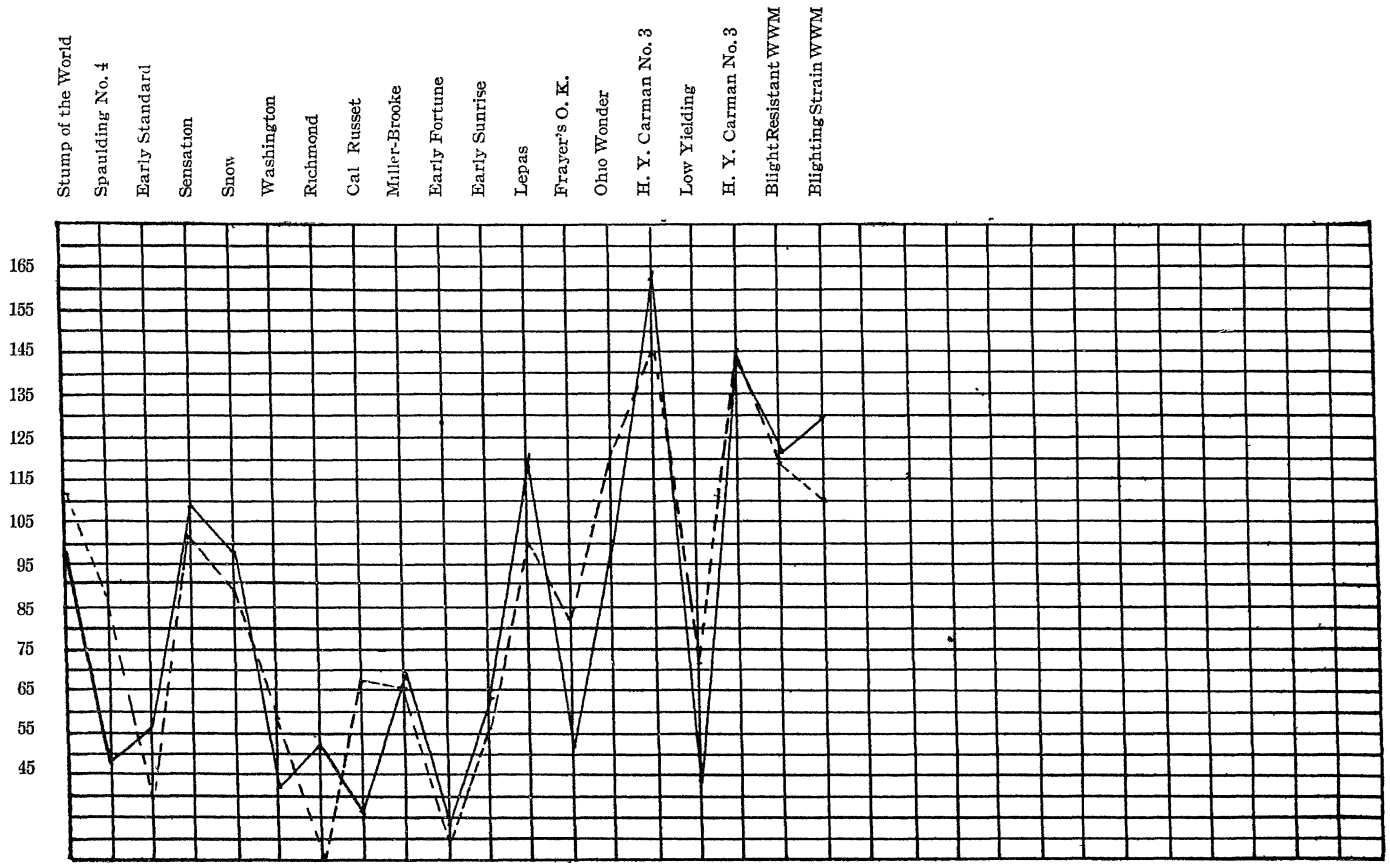

CHART I—Continued. Comparative yields of potatoes grown at Experiment Station on silt loam soil.